

# G. T. Seaborg Institute for Transactinium Science

*Specialized equipment and expertise in transactinium science available for collaborative research and student training*

**U**nique facilities, complex and specialized equipment, and diverse expertise not commonly found in industrial or university settings are available for collaborative research and student training at the Glenn T. Seaborg Institute for Transactinium Science (ITS). The goal of ITS is to provide a focus and mechanism for cooperation and collaboration with the campuses and laboratories of the University of California, with other universities and national laboratories, with industry, and with the international transactinium community. Located in an unclassified area at LLNL, the Institute comprises some 25,000 square feet of office and laboratory space.

The ITS was established in 1991 to foster the fundamental and applied science and technology of the transactinium elements, which begin with thorium and extend through the heaviest element currently known, element 109. Special emphasis is placed on the education and training of the future generation of scientists with the knowledge and expertise required to meet the nation's changing needs in environmental protection and restoration programs, energy policy, national security and nuclear surveillance activities, nuclear waste isolation, nuclear medicine, and the associated research and development activities.

## APPLICATIONS

- Develop complexing agents to remove plutonium from waste streams
- Study solubility and speciation of actinides in natural groundwater systems
- Research the electronic, nuclear, and chemical properties of heaviest elements

## Facilities and instrumentation

A number of instruments are available at LLNL's ITS site for collaborative use and for training. These include:

**Spectroscopy systems:** An extensive array of systems is available for measurements of optical absorption spectra for the quantification and characterization of actinide species in aqueous solution, including concentration, oxidation state, complexation, dissolved or colloidal forms.



**Nuclear radiation detection equipment:** The following equipment is available for measurement of alpha, beta, and gamma activity:

- Silicon surface barrier spectrometer for alpha measurements
- Intrinsic germanium spectrometer for gamma-ray measurements
- Liquid scintillation system for alpha and beta counting of liquid samples.

**Instruments to study and characterize small solid samples:**

- Scanning electron microscope (energy dispersive for elemental analysis)
- Electron microprobe for quantitative analysis
- Fourier transform infrared spectrometer
- Systems for x-ray diffraction measurements on powder and single crystal samples
- Standard glove boxes for working with highly alpha-radioactive actinide samples.

## Education and training

Summer positions for undergraduate and graduate students are available. Postdoctoral appointments are advertised at regular intervals. There are also opportunities for short-term visitors at various levels and for training. We are seeking collaborations with industry.

## Contact

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